TROPICAL RAINFALL MEASURING MISSION

January 19, 1998 - January 25, 1998
DOY 019 - 025

TRMM MISSION OPERATIONS

- The next Delta-V maneuvers are scheduled for February 4 and 14, 1998.
- TRMM is flying in the +X direction.
- Next yaw maneuver is January 29, 1998 at 23:30z.
- Final Operational Database is scheduled for January 26, 1998.
- Beta angle range for the week of January 26 - February 1 is 11° to -10°.

TRMM SUBSYSTEM OPERATIONS

Attitude Control System

The Delta V maneuver scheduled for Day 24, which was the first to use the LBS thrusters, was unsuccessful. During the first burn at 18:12:00 the Y-Axis System Momentum exceeded 30 Nms after 10.5 seconds, tripping FDC Test 93 (Anomaly #52). This test took Action 12, aborting the burn and aborting the ATS load. RTS 125 finished execution, disabling the mode transition and returning CERES to Crosstrack Mode. RTS 121 was started by real-time command to turn the Catbed Heaters off and disable all Delta V RTSs (120-125). A slight off-modulation of 2 counts was observed in Thruster 2 at the end of the 10.5 seconds, resulting in a count of 82 as opposed to the expected 84. The abort occurred because the threshold of FDC test #93 was set too tight. After investigation, it was determined that the same behavior was observed during the 10 sec. calibration burn on Day 335, but came just short of tripping because it ended at 10 sec. exactly, and therefore was overlooked, only exceeding the 30 Nms threshold for 1 count. FDC test #93 was reset and Action #12 was re-enabled after the problem was determined to be limit related. FDF was notified to create a new EPV. The FOT would like to thank all FDF personnel involved for their speedy response and quick turnaround of the new EPV and the rescheduled Delta V.

Later Saturday night the new TRMM EPV was delivered from FDF. It failed continuity check for position (X, Y, Z) at 0100z (Anomaly #53). Table #86 (T1997321_0086_ASPR.TABLD_01) was loaded, with new values to disable continuity checking (The ACS propagated ephem, downlinked in telemetry, was compared to the new EPV, delivered by FDF, and was close). The TDRS West BU (TDRS 171) ephem went to disable because it was set that way in the table (Table from launch was used). TRMM EPV was reloaded for 0500z, and it executed without error. Table #86 was reloaded with its default values(T1997321_0086_ASPR.TABLD_02). Also, ACS table #82 was loaded(T1998013_0082_ASPR.TABLD_01) to widen the limits for the DSS update to insure that they would execute properly, though it was not necessary since the update was less than 0.2°. A new TDRS West BU EPV was loaded for 0600z. Once a yaw update was received, table #82 was reloaded to return to the normal DSS update thresholds (T1997346_0082_ASPR.TABLD_01).

The rescheduled pair of Delta V burns on Day 25, at 18:44:09 and 19:29:50, were successful. The durations were 33.5 and 28.0, respectively, and the fuel budget is now 859.063 kg. Thruster 2 off-modulated during both burns, at about 79.5% and 75% respectively. The Y System Momentum for the first burn was 29.4 Nms and the second was 39.1 Nms.

Flight Data System (FDS)/Command & Data Handling (C&DH)

FS/Clock

It was decided in the Thursday morning meeting that the S/C clock will be allowed to drift towards the 1 millisecond specification limit to better examine the behavior of the Frequency Standard. The clock will be allowed to drift until approximately 900 microseconds, instead of the usual 500 microsecond guideline originally adopted. Extrapolation of the data collected by Day 24 showed that the clock would drift past 900 microseconds by 0700z on Day 25 because of a 13 µsec/hr frequency drift. The Frequency Standard was therefore adjusted by -26 counts to a value of 1815 (717 hex). The drift at this time is approximately 2 µsec/hr. with the UTCF at approximately 580 µsec. The table below shows the adjustments of the FS that occurred during this week.

DOY-hh:mm:ss	FS Adjustment
020-13:16:57	x'731' or 1841 cnts (+8)
024-19:54:08	x'717' or 1815 cnts (-26)

Solid State Recorders

Data Storage operations were nominal. All recorded data was successfully recovered.
The Software Bus received an "Invalid Stream Id from XS; received 1d0x" error at 6:15:04 on Day 22. It was caused by another VIRS Event #20 (Anomaly #26).

On Day 23, at 12:08:04, the TC task of the S/C processor went to FLYWHEEL Mode for 3 seconds (Anomaly #51). Investigation showed the delta in the timetag for APID 1, normally 4 seconds, skewed for approximately 16-20 seconds (when it settled down) and resulted in a shift of the output of that packet one second earlier (still output every 4 seconds). This behavior was not seen in any other subsystem and is not related to the Clock/FS anomaly experienced before launch. Investigation to determine the cause continues.

Still receiving Q Channel Restarts, though still not causing any loss of data.

Still receiving EDAC Multi-bit errors.

Reaction Control Subsystem (RCS)

The RCS performed nominally during this time period (see ACS section above for Delta V information).

Power Subsystem

The Power Subsystem performed nominally during this period.

Electrical Subsystem

The Electrical subsystem performed nominally during this period.

Thermal Subsystem

The Thermal subsystem operated nominally during this period.

Deployables Subsystem

The Playback Flight Status Recorder received a message stating that the HGA exceeded the software stop at 15:42:41z on Day 24. This is believed to be due to another bad GSACE packet, since the HGA was feathered at the time, and is being tracked by Discrepancy #46. Investigation continues.

RF/Communications Subsystem

The RF/Comm. subsystem operated nominally during this period.

During a scheduled 1/4 kbps (Day 21-1027z) the AGC was relatively low and many dropouts in the return link were observed. A Return Reacquisition was performed which cleared the problem.

Transponder 2 false locked on a 32/2 event on Day 19 (2227z): Lost PN Long Code and Detector Lock. A Forward Reacquisition cleared the problem.

SPACECRAFT INSTRUMENTS

CERES

The CERES Instrument performed nominally while executing its normal sequence of Crosstrack/Biaxial commanding. All checkout activities concluded prior to the week, and the instrument is now in normal operations.

Internal Calibrations		**Solar Calibrations**	
Date	Time	Date	Time
day 019, Jan 19	14:14:00z	N/A	N/A

LIS

Instrument performed nominally. A command request was performed on Day 23 to enable the watchdog timer, command it to time-out (which essentially resets the instrument), reset the thresholds (to the previous values), and reset the background mode to 8 kbps. When a watchdog reset is performed on the instrument, default thresholds are reloaded and the background send mode is put to 6 kbps.

PR

Instrument performed nominally. Checkout activities have concluded for PR, and the instrument is now in normal operations. It was found that the instrument was left radiating during the Australian Region Restriction on Day 13 because of out-of-date products used for scheduling: Scheduled 11:14:03-11:15:17, Actual 11:14:39-11:15:53. This will be avoided in the future by restricting the age of the files used for building the loads.

TMI

TMI performed nominally.

VIRS

VIRS received another event #20, which caused a Software Bus error (see FDS section above).

GROUND SYSTEM

Another obstacle has been experienced in the scheduling of TDRS time. This is the limitation of bandwidth of the MDM at WSC. There have been a few occurrences that time has been available, but because of our high data rate, it rejected by the NCC. This adds to the strain of getting events every orbit to avoid data loss.

The first event on the newly reactivated TDRS-7 (171) was successfully scheduled and performed at 1944z on Day 22. An EPV was generated and uplinked and verified by observing the calculated gimbal solutions, which coordinated with the FDF provided values. A blind acquisition was performed for the AOS and LOS and a nominal playback was downlinked. At this time the MOC software is having problems processing certain planning aids and is being investigated so events can be performed from the Stored Command Loads.

The RAID temporarily hung on Day 19 just before an event (0215z), causing that event to be taken on the backup string. Later that day the RAID again crashed, causing operations to be run from the backup server for the next 6 hours. Discussions are in progress to determine whether the problem is a system configuration problem or that the RAID needs to be replaced with a hard drive.

There was a problem encountered on the 6-0198 extension on Day 19. The line was being used for outside calls, but no outside calls were being accepted. Voice Control was notified and is working the problem.

More troubleshooting was performed on Port #3 (Anomaly #15) on Day 20. This caused commanding to be interrupted on the primary real-time string forcing an event to be taken on the backup. This was fixed and operations returned to the primary. No further conclusions have been derived about the port, and Port #14 has now been designated as the permanent NCC Port for string 1.

The following event reports were written during this period:

#7: RAID Failure
#8: LTS Port #3 Trouble/String Failover

ANOMALIES

The following discrepancy reports were written during this time:

#51: TC Flywheel (see FDS section above).
#52: Delta V Aborted (see ACS section above).
#53: EPV Failed Continuity (see ACS section above).

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